

**AMENDMENTS TO THE CLAIMS**

Please amend the claims as follows:

Claim 1. (Currently amended): An assay platform comprising a substrate and a polymer matrix attached to the substrate, wherein the polymer matrix binds to target molecules through a binding ligand and, ~~wherein the polymer matrix is comprises a plurality of polymer molecules, wherein at least some of the polymer molecules are covalently attached directly to the substrate to provide a, wherein at least some of the polymer molecules are crosslinked to other polymer molecules, wherein at least some of the polymer molecules have at least one binding ligand covalently attached thereto, and wherein the density of the polymer matrix on the substrate of is at least 2  $\mu\text{g}/\text{cm}^2$ .~~

Claim 2. (Original): The assay platform according to claim 1 wherein the density of the polymer matrix on the substrate is 4  $\mu\text{g}/\text{cm}^2$  to 30  $\mu\text{g}/\text{cm}^2$ .

Claim 3. (Original): The assay platform according to claim 1 wherein the density of the polymer matrix on the substrate is 6  $\mu\text{g}/\text{cm}^2$  to 15  $\mu\text{g}/\text{cm}^2$ .

Claim 4. (Original): The assay platform according to claim 1 wherein the polymer matrix has a binding ligand density of at least 1 nanomole/ $\text{cm}^2$ .

Claim 5. (Original): The assay platform according to claim 1 wherein the polymer matrix has a binding ligand density of 1.2 nanomoles/ $\text{cm}^2$  to 185 nanomoles/ $\text{cm}^2$ .

Claim 6. (Original): The assay platform according to claim 1 wherein the polymer matrix has a binding ligand density of 1.5 nanomoles/ $\text{cm}^2$  to 90 nanomoles/ $\text{cm}^2$ .

Claim 7. (Original): The assay platform according to claim 1 wherein the polymer matrix has a binding ligand density of 1.8 nanomoles/cm<sup>2</sup> to 15 nanomoles/cm<sup>2</sup>.

Claim 8. (Original): The assay platform according to claim 1 wherein the substrate is a multi-well plate.

Claim 9. (Original): The assay platform according to claim 8 wherein the multi-well plate is a 96, 384 or 1536 well polystyrene or polypropylene multiwell plate.

Claim 10. (Previously presented): The assay platform according to claim 1 wherein the substrate is a Matrix Assisted Laser Desorption Ionization (MALDI) plate.

Claim 11. (Original): The assay platform according to claim 1 wherein the substrate is glass.

Claim 12. (Original): The assay platform according to claim 1 wherein the substrate is plastic.

Claim 13. (Currently amended): The assay platform according to claim 113 wherein the polymer molecules are natural polymers.

Claim 14. (Currently amended): The assay platform according to claim 113 wherein the polymer molecules are dextran polymers.

Claim 15. (Currently amended): The assay platform according to claim 113 wherein the polymer molecules are synthetic polymers.

Claim 16. (Currently amended): The assay platform according to claim 113 wherein the polymer matrix binds to target molecules having a molecular weight of less than 3.5 kDa in an amount of at least 1 nanomole/cm<sup>2</sup>.

Claim 17. (Previously presented): The assay platform according to claim 1 wherein the polymer matrix binds to target molecules having a molecular weight of 3.5 kDa to 500 kDa in an amount of 0.5 µg/cm<sup>2</sup> to 20 µg/cm<sup>2</sup>.

Claim 18. (Previously presented): The assay platform according to claim 1 wherein the polymer matrix binds to target molecules having a molecular weight of 10 kDa to 500 kDa in an amount of 1 µg/cm<sup>2</sup> to 20 µg/cm<sup>2</sup>.

Claim 19. (Previously presented): The assay platform according to claim 1 wherein the polymer matrix binds to target molecules having a molecular weight of 10 kDa to 350 kDa in an amount of 2 µg/cm<sup>2</sup> to 20 µg/cm<sup>2</sup>.

Claim 20. (Previously presented): The assay platform according to claim 1 wherein the polymer matrix binds to target molecules having a molecular weight of 10 kDa to 350 kDa in an amount of 3 µg/cm<sup>2</sup> to 15 µg/cm<sup>2</sup>.

Claim 21. (Previously presented): The assay platform according to claim 1 wherein the polymer matrix binds to target molecules having a molecular weight of 10 kDa to 350 kDa in an amount of 4 µg/cm<sup>2</sup> to 10 µg/cm<sup>2</sup>.


Claim 22. (Previously presented): The assay platform according to claim 1 wherein the binding ligand binds to a polypeptide target molecule.

Claim 23. (Previously presented): The assay platform according to claim 1 wherein the polymer matrix binds to polypeptide target molecules having a molecular weight up to 350 kDa in an amount of at least 2  $\mu\text{g}/\text{cm}^2$ .

Claim 24. (Original): The assay platform according to claim 1 wherein the binding ligand comprises a metal chelate.

Claim 25. (Original): The assay platform according to claim 24 wherein the metal chelate is iminodiacetic acid, nitriloacetic acid or an analog thereof.

Claim 26. (Previously presented): The assay platform according to claim 1 wherein the binding ligand binds to a polynucleotide target molecule.

 Claim 27. (Previously presented): The assay platform according to claim 1 wherein the binding ligand binds to a mRNA target molecule.

Claim 28. (Previously presented): The assay platform according to claim 1 wherein the binding ligand binds to a DNA target molecule.

Claim 29. (Original): The assay platform according to claim 1 wherein the binding ligand comprises a polynucleotide.

Claim 30. (Currently amended): The assay platform according to claim 116 wherein the binding ligand is covalently attached to the polymer molecule through a spacer.

Claim 31. (Original): The assay platform according to claim 30 wherein the spacer comprises a lysine molecule.

Claim 32. (Original): The assay platform according to claim 30 wherein the spacer further comprises an aminocaproic acid molecule.

Claim 33. (Currently amended): The assay platform according to claim 113 wherein the substrate is a multiwell polystyrene plate, wherein the polymer molecules are dextran polymers, wherein the binding ligand is a nickel chelate, and wherein the polymer matrix has a binding ligand density of 1.5 nanomoles/cm<sup>2</sup> to 7.5 nanomoles/cm<sup>2</sup>.

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Claim 34. (Currently amended): The assay platform according to claim 113 wherein the substrate is a multiwell polystyrene plate, wherein the polymer molecules are dextran polymers, wherein the binding ligand is a Gallium or Iron chelate, and wherein the polymer matrix has a binding ligand density of 1.5 nanomoles/cm<sup>2</sup> to 7.5 nanomoles/cm<sup>2</sup>.

Claim 35. (Currently amended): The assay platform according to claim 113 wherein the substrate is a multiwell polystyrene plate, wherein the polymer molecules are dextran polymers, wherein the binding ligand is glutathione, and wherein the polymer matrix has a binding ligand density of 1.5 nanomoles/cm<sup>2</sup> to 7.5 nanomoles/cm<sup>2</sup>.

Claim 36. (Currently amended): The assay platform according to claim 113 wherein the substrate is a multiwell polypropylene or polycarbonate plate, wherein the

polymer molecules are dextran polymers and wherein the binding ligand is an oligonucleotide.

Claim 37. (Currently amended): The assay platform according to claim 113 wherein the substrate is a multiwell polystyrene plate or a multiwell polypropylene plate, wherein the polymer molecules are dextran polymers, wherein the binding ligand is streptavidin, and wherein the polymer matrix has a binding ligand density of  $1.5 \mu\text{g}/\text{cm}^2$  to  $7.5 \mu\text{g}/\text{cm}^2$ .

Claim 38. (Currently amended): The assay platform according to claim 113 wherein the substrate is a multiwell polystyrene plate, wherein the polymer molecules are dextran polymers, wherein the binding ligand is selected from the group consisting of protein A, protein G, protein L, or a mixture thereof and wherein the polymer matrix has a binding ligand density of  $1.5 \mu\text{g}/\text{cm}^2$  to  $7.5 \mu\text{g}/\text{cm}^2$ .

Claim 39. (Withdrawn): A method of preparing an assay platform comprising a substrate and a polymer matrix attached to the substrate, wherein the polymer matrix is capable of binding target molecules comprising:

contacting the substrate with a polymer composition comprising a plurality of polymer molecules having repeating units, wherein at least some of the polymer molecules have at least one reactive group covalently attached thereto, wherein at least some of the polymer molecules have at least one binding ligand covalently attached thereto, wherein the polymer molecules have an average molecular weight of at least 100 kDa, and wherein at least 25% of the polymer

molecules have at least one reactive group and at least one binding ligand covalently attached thereto; and

activating the reactive groups to covalently bind at least some of the polymer molecules directly to the substrate and to induce cross-linking between polymer molecules to form a polymer matrix attached to the substrate.

Claim 40. (Withdrawn): The method according to claim 39 wherein all of the polymer molecules have at least one binding ligand covalently attached thereto and wherein at least some of the polymer molecules have no reactive group covalently attached thereto.

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Claim 41. (Withdrawn): The method according to claim 39 further comprising drying the polymer composition on the substrate prior to activating the reactive groups.

Claim 42. (Withdrawn): The method according to claim 41 further comprising derivatizing the binding ligand in the formed polymer matrix by attaching thereto a different binding ligand.


Claim 43. (Withdrawn): The method according to claim 39 wherein the reactive groups are covalently attached to the polymer molecules through a spacer.

Claim 44. (Withdrawn): The method according to claim 43 wherein the spacer comprises a lysine molecule.

Claim 45. (Withdrawn): The method according to claim 43 wherein the spacer further comprises an aminocaproic acid molecule.

Claim 46. (Withdrawn): The method according to claim 39 wherein the reactive groups are  $\alpha$ ,  $\beta$  unsaturated ketone photo-reactive groups and wherein the photo-reactive groups are activated by exposure to light at from about 1,000 mWatts/cm<sup>2</sup> to about 5,000 mWatts/cm<sup>2</sup>.

Claim 47. (Withdrawn): The method according to claim 39 wherein the reactive groups are  $\alpha$ ,  $\beta$  unsaturated ketone photo-reactive groups and wherein the photo-reactive groups are activated by exposure to light at from about 1,000 mWatts/cm<sup>2</sup> to about 3,000 mWatts/cm<sup>2</sup>.

 Claim 48. (Withdrawn): The method according to claim 39 wherein the reactive groups are  $\alpha$ ,  $\beta$  unsaturated ketone photo-reactive groups and wherein the photo-reactive groups are activated by exposure to light at from about 1,500 mWatts/cm<sup>2</sup> to about 2,500 mWatts/cm<sup>2</sup>.

Claim 49. (Withdrawn): The method according to claim 39 wherein the reactive groups are  $\alpha$ ,  $\beta$  unsaturated ketone photo-reactive groups and wherein the photo-reactive groups are activated by exposure to light at from about 3 Joules/cm<sup>2</sup> to about 6 Joules/cm<sup>2</sup>.

Claim 50. (Withdrawn): The method according to claim 39 wherein the reactive groups are benzophenone groups and wherein the photo-reactive groups are activated by exposure to light for 0.5 sec/cm<sup>2</sup> to 5.0 sec/cm<sup>2</sup>.



Claim 51. (Withdrawn): The method according to claim 39 wherein an amount of the polymer composition is contacted with the substrate to provide a polymer matrix having a density of  $4 \mu\text{g}/\text{cm}^2$  to  $30 \mu\text{g}/\text{cm}^2$ .

Claim 52. (Withdrawn): The method according to claim 39 wherein an amount of the polymer composition is contacted with the substrate to provide a polymer matrix having a density of  $6 \mu\text{g}/\text{cm}^2$  to  $15 \mu\text{g}/\text{cm}^2$ .

Claim 53. (Withdrawn): The method according to claim 39 wherein an amount of the polymer composition is contacted with the substrate to provide a polymer matrix having a binding ligand density of at least 1 nanomole/ $\text{cm}^2$ .

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Claim 54. (Withdrawn): The method according to claim 39 wherein an amount of the polymer composition is contacted with the substrate to provide a polymer matrix having a binding ligand density of 1.2 nanomoles/ $\text{cm}^2$  to 185 nanomoles/ $\text{cm}^2$ .


Claim 55. (Withdrawn): The method according to claim 39 wherein an amount of the polymer composition is contacted with the substrate to provide a polymer matrix having a binding ligand density of 1.5 nanomoles/ $\text{cm}^2$  to 90 nanomoles/ $\text{cm}^2$ .

Claim 56. (Withdrawn): The method according to claim 39 wherein an amount of the polymer composition is contacted with the substrate to provide a polymer matrix having a binding ligand density of 1.8 nanomoles/ $\text{cm}^2$  to 15 nanomoles/ $\text{cm}^2$ .

Claim 57. (Withdrawn): The method according to claim 39 wherein the polymer molecules having reactive groups covalently attached thereto have less than 1 reactive group per 200 repeating units.

Claim 58. (Withdrawn): The method according to claim 39 wherein the polymer molecules having reactive groups covalently attached thereto have less than 1 reactive group per 600 repeating units.

Claim 59. (Withdrawn): The method according to claim 39 wherein the polymer molecules having binding ligand covalently attached thereto have from 1 binding ligand per 1 repeating unit to 1 binding ligand per 100 repeating units.

 Claim 60. (Withdrawn): The method according to claim 39 wherein the polymer molecules having binding ligand covalently attached thereto have from 1 binding ligand per 1 repeating unit to 1 binding ligand per 20 repeating units.

Claim 61. (Withdrawn): The method according to claim 39 wherein the polymer molecules have an average molecular weight of 300 kDa to 6,000 kDa.


Claim 62. (Withdrawn): The method according to claim 39 wherein the polymer molecules have an average molecular weight of 400 kDa to 3,000 kDa.

Claim 63. (Withdrawn): The method according to claim 39 wherein the polymer molecules have an average molecular weight of 500 kDa to 2,000 kDa.

Claim 64. (Withdrawn): The method according to claim 39 wherein the percentage of polymer molecules having both reactive groups and binding ligand covalently attached thereto is from 25% to 80%.

Claim 65. (Withdrawn): The method according to claim 64 wherein the percentage of polymer molecules having both reactive groups and binding ligand covalently attached thereto is from 40% to 75%.

Claim 66. (Withdrawn): The method according to claim 65 wherein the percentage of polymer molecules having both reactive groups and binding ligand covalently attached thereto is from 50% to 60%.

 Claim 67. (Withdrawn): The method according to claim 66 wherein the percentage of polymer molecules having both reactive groups and binding ligand covalently attached thereto is approximately 50%.

Claim 68. (Withdrawn): The method according to claim 39 wherein the binding ligand is covalently attached to the polymer molecules through a spacer.

Claim 69. (Withdrawn): The method according to claim 68 wherein the spacer comprises a lysine molecule.

Claim 70. (Withdrawn): The method according to claim 68 wherein the spacer further comprises an aminocaproic acid molecule.


Claim 71. (Withdrawn): The method according to claim 39 wherein the substrate is a multiwell plate.

Claim 72. (Withdrawn): The method according to claim 71 wherein the multiwell plate is selected from the group consisting of a 96 well polystyrene plate, a 96 well polypropylene plate, a 384 well polystyrene plate and a 384 well polypropylene plate.

Claim 73. (Withdrawn): The method according to claim 39 wherein the substrate is a MALDI plate.

Claim 74. (Withdrawn): The method according to claim 39 wherein the substrate is glass.


Claim 75. (Withdrawn): The method according to claim 39 wherein the substrate is plastic.

 Claim 76. (Withdrawn): The method according to claim 39 wherein the substrate is a multiwell polystyrene plate, wherein the polymer molecules are dextran polymers, wherein the binding ligand is a nickel chelate, and wherein an amount of the polymer composition is contacted with the substrate to provide a polymer matrix having a binding ligand density of 1.5 nanomoles/cm<sup>2</sup> to 7.5 nanomoles/cm<sup>2</sup>.

Claim 77. (Withdrawn): The method according to claim 39 wherein the substrate is a multiwell polystyrene plate, wherein the polymer molecules are dextran polymers, wherein the binding ligand is a Gallium or Iron chelate, and wherein an amount of the polymer composition is contacted with the substrate to provide a polymer matrix having a binding ligand density of 1.5 nanomoles/cm<sup>2</sup> to 7.5 nanomoles/cm<sup>2</sup>.

Claim 78. (Withdrawn): The method according to claim 39 wherein the substrate is a multiwell polystyrene plate, wherein the polymer molecules are dextran polymers, wherein the binding ligand is glutathione, and wherein an amount of the polymer composition is contacted with the substrate to provide a polymer matrix having a binding ligand density of 1.5 nanomoles/cm<sup>2</sup> to 7.5 nanomoles/cm<sup>2</sup>.

Claim 79. (Withdrawn): The method according to claim 39 wherein the substrate is a multiwell polypropylene plate, wherein the polymer molecules are dextran polymers, wherein the binding ligand is an oligo dT, and wherein an amount of the polymer composition is contacted with the substrate to provide a polymer matrix having a binding ligand density of 1.5 nanomoles/cm<sup>2</sup> to 7.5 nanomoles/cm<sup>2</sup>.

 Claim 80. (Withdrawn): The method according to claim 39 wherein the substrate is a multiwell polystyrene plate or a multiwell polypropylene plate, wherein the polymer molecules are dextran polymers, wherein the binding ligand is streptavidin, and wherein an amount of the polymer composition is contacted with the substrate to provide a polymer matrix having a binding ligand density of 1.5 µg/cm<sup>2</sup> to 7.5 µg/cm<sup>2</sup>.

Claim 81. (Withdrawn): The method according to claim 39 wherein the substrate is a multiwell polystyrene plate, wherein the polymer molecules are dextran polymers, wherein the binding ligand is selected from the group consisting of protein A, protein G, protein L, or a mixture thereof and wherein an amount of the polymer composition is contacted with the substrate to provide a polymer matrix having a binding ligand density of 1.5 µg/cm<sup>2</sup> to 7.5 µg/cm<sup>2</sup>.

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Claim 82. (Withdrawn): An assay platform produced by the method of claim 39.

Claim 83. (Withdrawn): An assay platform produced by the method of claim 40.

Claim 84. (Withdrawn): An assay platform produced by the method of claim 41.

Claim 85. (Withdrawn): An assay platform produced by the method of claim 57.

Claim 86. (Withdrawn): An assay platform produced by the method of claim 58.

 Claim 87. (Withdrawn): An assay platform produced by the method of claim 59.

Claim 88. (Withdrawn): An assay platform produced by the method of claim 60.


Claim 89. (Withdrawn): An assay platform produced by the method of claim 61.

Claim 90. (Withdrawn): An assay platform produced by the method of claim 62.

Claim 91. (Withdrawn): An assay platform produced by the method of claim 73.

Claim 92. (Withdrawn): An assay platform produced by the method of claim 74.

Claim 93. (Withdrawn): An assay platform produced by the method of claim 75.

 Claim 94. (Withdrawn): A polymer composition comprising a plurality of polymer molecules having repeating units, wherein at least some of the polymer molecules have at least one reactive group covalently attached thereto, wherein at least some of the polymer molecules have at least one binding ligand covalently attached thereto, wherein the polymer molecules have an average molecular weight of at least 100 kDa, and wherein at least 25% of polymer molecules have at least one reactive group and at least one binding ligand covalently attached thereto.


Claim 95. (Withdrawn): A polymer composition according to claim 94 wherein the polymer molecules have an average molecular weight of at least 300 kDa.

Claim 96. (Withdrawn): The polymer composition according to claim 94 wherein all of the polymer molecules have at least one binding ligand covalently attached thereto and wherein at least some of the polymer molecules have no reactive group covalently attached thereto.

Claim 97. (Withdrawn): The polymer composition according to claim 94 wherein the polymer molecules having reactive groups covalently attached thereto have less than 1 reactive group per 200 repeating units.

Claim 98. (Withdrawn): The polymer composition according to claim 94 wherein the polymer molecules having reactive groups covalently attached thereto have less than 1 reactive group per 600 repeating units.

Claim 99. (Withdrawn): The polymer composition according to claim 94 wherein the polymer molecules having binding ligand covalently attached thereto have from 1 binding ligand per 1 repeating unit to 1 binding ligand per 100 repeating units.

 Claim 100. (Withdrawn): The polymer composition according to claim 94 wherein the polymer molecules having binding ligand covalently attached thereto have from 1 binding ligand per 1 repeating unit to 1 binding ligand per 20 repeating units.

Claim 101. (Withdrawn): The polymer composition according to claim 94 wherein the percentage of polymer molecules having both reactive groups and binding ligand covalently attached thereto is from 25% to 80%.

Claim 102. (Withdrawn): The polymer composition according to claim 101 wherein the percentage of polymer molecules having both reactive groups and binding ligand covalently attached thereto is from 40% to 75%.



Claim 103. (Withdrawn): The polymer composition according to claim 102 wherein the percentage of polymer molecules having both reactive groups and binding ligand covalently attached thereto is from 50% to 60%.

Claim 104. (Withdrawn): The polymer composition according to claim 103 wherein the percentage of polymer molecules having both reactive groups and binding ligand covalently attached thereto is approximately 50%.

Claim 105. (Withdrawn): The polymer composition according to claim 94 wherein the polymer molecules are natural polymers.

Claim 106. (Withdrawn): The polymer composition according to claim 94 wherein the polymer molecules are dextran polymers.

Claim 107. (Withdrawn): The polymer composition according to claim 94 wherein the polymer molecules are synthetic polymers.

Claim 108. (Withdrawn): The polymer composition according to claim 94 wherein the binding ligand comprises a metal chelate.

Claim 109. (Withdrawn): The polymer composition according to claim 94 wherein the binding ligand is capable of binding to a polynucleotide.

Claim 110. (Withdrawn): The polymer composition according to claim 94 wherein the binding ligand comprises an mRNA.


Claim 111. (Withdrawn): The polymer composition according to claim 94 wherein the binding ligand comprises a DNA.

Claim 112. (Withdrawn): The polymer composition according to claim 94 wherein the binding ligand comprises a polynucleotide.

Claim 113. (New): An assay platform according to claim 1 wherein the polymer matrix comprises a plurality of polymer molecules.

Claim 114. (New): An assay platform according to claim 113 wherein the polymer matrix is covalently attached to the substrate through at least some of the polymer molecules.

Claim 115. (New): An assay platform according to claim 114 wherein at least some of the polymer molecules are crosslinked to other polymer molecules in the polymer matrix.

 Claim 116. (New): An assay platform according to claim 115 wherein the binding ligand is covalently attached to at least some of the polymer molecules.

Claim 117 (New): An assay platform comprising:

(a) a substrate; and

(b) a polymer matrix comprising

(1) a plurality of polymer molecules, wherein the polymer matrix is covalently attached directly to the substrate through some of the polymer molecules to provide a density of the polymer matrix on the substrate of at least  $2 \mu\text{g}/\text{cm}^2$ ; some of the polymer molecules are crosslinked to each other; and some of the polymer molecules have at least one binding

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ligand covalently attached thereto for binding to target  
molecules.

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